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Supplementary appendix

This appendix formed part of the original submission and has been peer reviewed. We post it as supplied by the authors.

Supplement to: Telisinghe L, Charalambous S, Topp S M, et al. HIV and tuberculosis in prisons in sub-Saharan Africa. *Lancet* 2016; published online July 14. http://dx.doi.org/10.1016/S0140-6736(16)30578-5.

WEB EXTRA MATERIAL: HIV and tuberculosis in prisons in sub-Saharan Africa

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Web appendix 1: Methods

Literature reviews (epidemiology, screening, diagnosis, treatment and prevention of HIV and TB)

Medline, Embase, African Index Medicus, Cochrane database of systematic reviews and the Cochrane central register of controlled trials were searched for published literature. The World Health Organization, United Nations Office on Drugs and Crime (UNODC), International Centre for Prison Studies, Médecins Sans Frontières (MSF), U. S. Census Bureau, Google Scholar and conference abstracts from the International AIDS Society Conference, The Union World Conference on Lung Health and the Conference on Retroviruses and Opportunistic Infections and the International Conference on AIDS and Sexually Transmitted Disease in Africa were searched for grey literature. All searches were conducted for studies published between January 2011 and December 2015. Bibliographies of identified studies were reviewed, and, experts on HIV and TB in prisons, including in-country experts, international experts, academics and experts at the UNODC, MSF, WHO and the joint United Nations Programme on HIV/AIDS were contacted for additional sources of information.

To supplement this search for recent publications, a Medline and Embase search was conducted from inception to December 2015, to identify historical studies on HIV and TB in sub-Saharan African prisons. For each country, the most recent year of publication was tabulated, allowing the pertinence of this information and gaps in readily available information to be determined.

The following terms were used to undertake searches in databases: 1) Prisons or Prisoners or (prison* or imprison* or detention or convict* or detainee* or refugee* or migrant* or gaol* or jail* or inmate* or offender* or penitentiar* or ((remand or asylum or correctional) adj2 (centre* or center* or facilit* or service*))); and 2) (Tuberculosis or Mycobacterium tuberculosis or [TB or tuberculosis or MTB or XDR-TB or XDRTB or MDRTB or MDR-TB]) or (Acquired Immunodeficiency Syndrome or [human immunodeficiency virus or HIV or acquired immunodeficiency syndrome or AIDS or retrovir*]); and 3) Africa South of the Sahara or (sub-sahara* or south of the sahara or west africa or east africa or southern africa or africa south of the sahara). For the grey literature searches, selected terms from 1, 2 and 3 above were used to identify studies.

Observational studies, (quasi-) randomised controlled trials and mixed-methods studies were eligible for inclusion. Studies were included irrespective of publication status, but were restricted to English, French and Portuguese language articles.

The International Centre for Prison Studies, the global reference dataset for prison population data was searched for information on prison population sizes in sub-Saharan Africa. For countries where available information preceded 2013, government and other international websites were searched, and information included where available.

National HIV and TB policies and available services

Case studies relating to HIV and TB policies and services in prisons in five countries (Zambia, South Africa, Malawi, Nigeria and Benin) were compiled. Given the extreme difficulty of accessing up-to-date information on this topic, country selection was purposive, and based on a combination of author knowledge and intent to present data geographically representative of the SSA region. Categories used to inform the collation of documentation related to: legislation on prisons; national health or HIV/TB-specific strategic plans or actions plans; national healthcare service guidelines; annual prison and prison health service reports; and official press releases related to health in prisons.

A first round of desk-based search focused on collating primary (actual policy or other official government) documents, via government websites and relevant departments from each country including Ministries/Departments of Health (MOH, DOH), Prison Departments, National Tuberculosis Programmes and National AIDS Councils. In addition the WHO and UNODC databases were searched. Major local news sources were canvassed but not systematically.

A second round desk-based search focused on secondary sources including reports, syntheses or analyses dealing with any aspect of detainee health in the five countries; given the relative dearth of such material there were no specific time limits. In addition to the above mentioned websites, regional non-government initiatives including the International Centre for Prisons Studies database, Open Society Foundation and the Southern African Litigation Centre were searched for relevant documentation. Although peer reviewed literature in this domain is scant, a supplementary scoping review was conducted on PubMed and Google Scholar to surface recent (< 5 year) articles with details relevant to the policies and operations of prison health in each countries.

Concurrent with the desk-searches, we interviewed, via email, at least one key informant from each country with current or recent (<2 years) experience working directly in prison health in country. Key informants included a mix of prison health officials, NGO employees and researchers and were already known to the authors. Over several rounds of communication, respondents were asked to describe or clarify: i) the current state of policy guidance for HIV and TB in prisons; ii) the governance structures and decision making protocols for health services in prison; and iii) the general operational status of HIV and TB (and more general health) services in prisons around the country. A list of the initial guiding questions are provided below; responses to these questions formed the basis of subsequent enquiries. Summary accounts based on the information gathered during all phases of the search, including email interviews, were compiled and provided to each key informant for fact checking and review.

Initial guiding questions:

Policy and Governance

1. Does [country] have prison-specific guidelines for HIV or TB treatment in prisons OR does the prison service use the Ministry of Health/Department of Health (MOH/DOH) guidelines / policies?
2. To your knowledge, is there anything in the MOH/DOH policies that conflicts with [country's] laws? (e.g. condom provision?)
3. According to the legislative framework, which government department bears responsibility for prison health services?

Operations

1. How are (general) health services delivered to detainees?
2. What proportion of [country's] prisons provide HIV and TB care and treatment services?
    - Can you describe any barriers to provision you know of
3. Are HIV and TB services delivered 'within' the prison or are detainees transported outside the prison to public health centres under guard?
4. Are health care professionals who take care of detainees employed by the prison service, or by the MOH/DOH, or by a combination of both?
5. Are indicators on HIV and TB incidence, treatment and outcome being collected in prisons? If so - what are the indicators and who is currently responsible for collecting them?

Funding for HIV and TB services

Two sources of funding for HIV and TB services within prisons are international donors and national governments. Four of the largest international donors of prison HIV/TB services in sub-Saharan Africa, The Global Fund Against AIDS, Tuberculosis and Malaria (Global Fund), the U.S. President's Emergency Plan for AIDS Relief (PEPFAR), the Department for International Development (DFID) and the European Union Funding Programme (EU), were approached for information on HIV and/or TB programmes funded within sub-Saharan African prisons between 2005 and 2015.

The Global Fund was unable to extract specific information on prison-related projects. However, they were able to provide the results from a search of project indicators that included references to prisons (and related terms). The results of this search were used to identify specific grant agreements, which were reviewed. Using these searches, information on funding was extracted and summarized. Where data on funding was not readily available, project documents were reviewed and funding allocations (but not disbursements) determined.

PEPFAR was also unable to extract data specific to prisons. However, amfAR, the Foundation for AIDS Research, maintains a database of PEPFAR Country Operational Plans which permits searches using keywords (available at: http://copsdata.amfar.org/s#). Using this resource, operational plans from sub-Saharan African countries were searched to identify relevant projects for the period that this information was available (2007-2014). As with the Global Fund data, information was based upon planned interventions, without specification of whether initiatives were conducted or not.

Web appendix 2: Overview of prison populations by country: proportion of female, juvenile and foreign detainees (taken from the International Centre for Prison studies http://www.prisonstudies.org)

Country	Prison population total	Proportion female	Proportion of juveniles	Proportion of foreign detainees
Angola	22826	2.7	-	-
Benin	7247	5.0	2.1	
Botswana	3960	2.4	6.6	14.1
Burkina Faso	6251	1.6	2.6	4.1
Burundi	8646	4.8	2.2	1.2
Cameroon	25914	2.5	3.3	2.4
Cape Verde	1434	4.0	-	-
Central African Republic	764	8.2	-	-
Chad	4831	2.8	3.3	1.3
Comoros	233	3.0	5.2	7.7
Congo (Brazzaville)	1240	3.7	4.4	-
Congo (Democratic Republic	21722	3.0	-	-
Côte d'Ivoire	10850	1.7	1.9	30.0
Djibouti	600	5.8	-	-
Equatorial Guinea	1000	5.6*	-	-
Eritrea	-	-	-	-
Ethiopia	111050	2.8	-	-
Gabon	3500	3.2	2.9	-
Gambia	1121	2.5	1.3	66.7
Ghana	14534	1.3	0.9	6.3
Guinea Republic	3110	3.7	6.3	2.7
Guinea-Bissau	92	4.3	-	-
Kenya	54154	5.3	0.5	0.7
Lesotho	2073	3.6	2.4	0.9
Liberia	1719	3.2	2.7	2.0
Madagascar	18719	4.5	2.3	0.1
Malawi	12156	1.1	7.7	0.2
Mali	5209	2.8	1.3	-
Mauritania	1768	1.2	3.1	-
Mauritius	2137	5.4	2.9	6.4
Mozambique	15976	3.9	0.0	0.9
Namibia	3560	2.4	1.1	5.5
Niger	7424	3.0	-	0
Nigeria	56620	2.0	1.7	0.3
Rwanda	54279	6.4	0.4	0.3
Sao Tome e Principe	201	1.5	8.2	0.8
Senegal	8630	3.4	2.1	10.7
Seychelles	735	6.1	1.3	7.5
Sierra Leone	3488	3.3	0.0	1.3
Somalia	3450	-	-	-
South Africa	159563	2.5	0.2	6.3
South Sudan	6504	10.9	-	-
Sudan	19101	2.0	2.0	1.0
Swaziland	3616	2.9	0.7	6.0
Tanzania	34196	3.4	3.9	3.7
Togo	4493	2.6	0.6	5.2
Uganda	45092	4.5	0.0	0.4
Zambia	18560	1.0	2.5	2.1
Zimbabwe	18857	1.8	0.5	2.0

*estimated from one prison in 2011

Web appendix 3: The epidemiology of HIV and TB within prisons in sub-Saharan Africa

Country, region and year	Author and year (source)	HIV			Independent RF/other¶	Population prevalence (source)	TB[j] (undiagnosed)			Independent RF/other¶	Population prevalence/IR (source)
		n	N	%			n	N	%/IR (undiagnosed)		
West and Central Africa											
Benin, national, 9 prisons, 2011	Wachinou, 2012[1] (conference abstract)						37	7148	500 per 100,000	-	0.11 (WHO TB report 2013)
Burkina Faso, Ouagadougou, 1 prison, 2/09-3/09	Diendre, 2011[2] (journal article)	15	300	5.0	-	1.2 (UNAIDS 2009)	4	300	1.30	-	0.09 (WHO TB report 2011)
Cameroon, Yaounde, 1 prison, 2009	Noeske, 2011[3] (journal article)	211	2633	8.0	-	5.3 (UNAIDS 2009)	105 (40)	3284 (3219)	1.20 (1.20)	BMI <18.5; overcrowding; previous TB	0.19 (WHO TB report 2011)
Cameroon, 10 prisons, 2008-2010	Noeske, 2011[4] (conference abstract)	-		2.3-9.0	*HIV infection among females 3 time higher than among males	5.3 (UNAIDS 2009)	-	-	-	-	-
Cameroon, 10 prisons targeted by the HIV/TB control programme of the Ministry of Justice. 10/11 to 9/12	Noeske 2014[5] (journal article)	-	-	-	-	-	178	10468 pyrs	1700 per 100000 pyrs	-	178 per 100000 pyrs for the population surrounding the prison (paper)
Cape Verde											
Central African Republic											
Chad											
Congo (Brazzaville)											
Congo (DRC), Bukavu 1 prison, 1/08 to 2/09	Mashako, 2012[6] (conference abstract)	93	912	10.2		3.1 in the surrounding town (paper)	-	-	-	-	-
Congo (DRC), Kasai Oriental province, 1 prison, 2015	Kaswa Kayomo, 2015[7] (conference abstract)	-	-	-	-	-	147	904	16.30	-	0.53 in 2014 (WHO TB report 2015)
Côte d'Ivoire, Abidjan, 1 prison,11/08-3/10	Angora 2011[8] (journal article)	-	-	5.6	*prevalence among males 5.1% and among females 17.1%	3.9 in 2008 (paper)	172	1348	12.80	-	0.16 (WHO TB report 2011)
Equatorial Guinea											
Gabon											
Gambia											
Ghana, 6/12-8/12	Adibokah, 2015[9] (conference abstract)	-	-	2.3	*prevalence among males 1.5% and among females 11.8%						
Guinea, Conakry, 1 prison, 5/09-6/10	Bah 2012[10] (journal article)						20	1084	1.80	-	75 per 100,000 in the population in Conakry (paper)
Guinea-Bissau											
Liberia											

Mali, 3 prisons	Camara 2015[11] (conference abstract)	-	-	-	-	-	(25)	(1900)	(1.30)	-	-
Mauritania, Nouachott	Ba 2015[12] (journal article)	-	-	3.9	-	<1 in population (paper)	-	-	-	-	-
Niger	*1994: Ousseini, HIV prevalence[13]*										
Nigeria, 2013	Gidado, 2014[14] (conference abstract)	-	-	-	-	-	340	53000	641 per 100000	-	61 per 100000 popn (paper)
Nigeria, Ogun state, 2 prisons	Muhammed 2012[15] (journal article)	8	340	2.4	*prevalence among males 2.2% and among females 6.3%	3.1 in Ogun state (paper)	-	-	-	-	-
Nigeria, Abia State, 1 prison	Okorie 2014[16] (conference abstract)	-	-	-	-	-	12 (11)	449 (448)	2.70 (2.40)	-	-
Sao Tome and Principe											
Senegal (and Togo), Dakar, 4/14-5/14	Jaquet 2015[17] (conference abstract)	-	-	2.9	-	0.5 (UNAIDS 2014)					
Sierra Leone											
Togo, 6 prisons, 11/11 to 1/12	Ekouevi, 2013[18] (journal article)	55	1289	4.3	Female gender *duration in prison not associated on multivariate analysis	3.4 (UNAIDS 2011)	-	-	-	-	-
Togo, Lome, 1 prison, 11/11-12/11	Akakpo 2013[19] (journal article)	21	194	10.8	-	3.4 (UNAIDS 2011)	-	-	-	-	-
Togo (and Senegal), Lome, 9/13-10/13	Jaquet 2015[17] (conference abstract)	-	-	2.9	-	2.4 in 2014 (UNAIDS 2014)					
East Africa											
Burundi											
Comoros											
Djibouti											
Eritrea											
Ethiopia, Gondar, 1 prison 2/08 to 7/08	Addis 2015[20] (journal article)	-	-	-	-	-	33	1624	2.00	-	0.43 (WHO TB report 2011)
Ethiopia, Dire Dawa, Jijiga and Harar, 3 prisons, 7/08 to 11/08	Abebe 2011[21] (journal article)	-	-	-	-	-	44 (33)	2300 (2289)	1.90 (1.40)	Younger age, living in urban residence, sharing a cell with a TB patient and sharing a cell with a chronic cougher.	0.43 (WHO TB report 2011)
Ethiopia, 8 regions, 23/111 prisons, 12/13	UNODC 2013[22] (UNODC report)	35	839	4.2	*on univariate analysis being employed and being divorced/separated associated with prevalent HIV	1.5 (paper)	-	-	-	-	-
Ethiopia, Gondar,	Moges, 2012[23] (journal article)	-	-	-	-	-	(26)	(1754)	(1.50)	HIV positivity and low BMI. *length of stay	All forms 0.6%; smear +ve 0.2% in Amhara

										in prison and number of detainees per cell not associated with TB in multivariable model.	Regional State during the study period (paper)
Ethiopia, Oromia, Nationalities and Peoples Regional state and Harari, 13 prisons, 1/13-12/13	Ali 2015[24] (journal article)	-	-	-	-	-	71 (20)	15495 (15444)	0.50 (0.10)	Incarcerated in a cell without a window, alcohol consumption and having contact with a TB case at home *multivariable model using data from TB suspects	0.2 for the country (paper)
Kenya, 36 prisons, 9/09-10/09	Benson Otieno, 2011[25] (conference abstract)	2782	48525	5.7	-	6.3 (UNAIDS 2009)	-	-	-	-	-
Malawi, national data, 2007	Kanyerere, 2012[26] (journal article)	-	-	-	-	-	147	33276	442 per 100,000	-	General population notification 55/100,000 (paper)
Malawi, 10/29 prisons, 10/11-11/11	Mwapasa, 2012[27] (UNAIDS report)	-	-	23[†]	-	10.0 (UNAIDS 2011)	-	-	4.40	-	0.16 (WHO TB report 2013)
Malawi, Mzimba prison, 03/15	Kanyerere, 2015[28] (conference abstract)	-	-	-	-	-	71	588	12.10	-	Case notification rate 97/100,000 in 2014 (WHO TB report 2015)
Rwanda, 3/14 prisons, 12/13-4/14	Ruseesa. 2014[29] (conference abstract)	-	-	-	-	-	(107)	(16902)	(0.60)	-	Case notification rate 51/100,000 population in 2014 (WHO TB report 2015)
Rwanda, national (all 14 Rwandan prisons), 12/13-4/15	Ruseesa 2015[30] (conference abstract)	-	-	-	-	-	(336)	(51826)	(0.60)		Case notification rate 51/100,000 population in 2014 (WHO TB report 2015)
Seychelles											
Somalia											
South Sudan											
Sudan, Khartoum, 5 prisons	Ibrahim 2013[31] (conference abstract)	-	-	-	-	-	(2)	(382)	(0.50)	Overcrowding, contact with a family member with TB and alcohol intake.	-
Tanzania, Mbeya, 3 prisons, 11/10 to 3/11	Angolwisye, 2011[32] (conference abstract)	147	978	15.0		Within range of general population prevalence of Mbeya (paper)	(30)	(1304)	(2.30)	-	0.18 (WHO TB report 2012)
Tanzania., Mbeya, all prisons in the region – incarcerated popualation, 11/10 to 11/11	Clowes, 2013[33] (conference abstract)	-	-	-	-	-	-	-	1.95	-	0.18 (WHO TB report 2012)

Tanzania., Mbeya, all prisons in the region – new entrants 11/10 to 11/11	Clowes, 2013[33] (conference abstract)	-	-	-	-	-	-	-	4.53	-	0.18 (WHO TB report 2012)
Tanzania, all 5 zones, 12 prisons, 9/12-12/12	Tanzania commission for AIDS, UNODC, Ministry of Home Affairs 2013[34] (UNODC report)	60	890	6.7	*On univariate analysis female gender and age 30-34 associated with prevalent HIV	5.3 (2011-2012 Tanzania HIV/AIDS and Malaria indicator survey – from report)					
Tanzania, 5 prisons, 7/13 to 4/14	Mangu, 2014[35] (conference abstract)	-	-	-	-	-	59	5182	1.10	*prevalence similar among incarcerated and newly entrant detainees (1.16% vs 1.02%)	0.17 (WHO TB report 2014)
Tanzania, Dar es Salaam, 3 prisons, 07/13-03/15	Van Den Hombergh, 2015[36] (conference abstract)	-	-	-	-	-	-	-	2.50	-	0.53 (WHO TB report 2015)
Tanzania, randomly and purposively selected prisons in Mainland Tanzania	Mutayoba 2014[37] (conference abstract)	52	776	6.7	*On univariate analysis female gender and age 30-34 was associated with prevalent HIV	5.1 national prevalence (abstract)	-	-	-	-	-
Uganda10 Regional Ugandan Prison Health Centres, 6/11 to 11/12	Schwitter 2014[38] (journal article)	-	-	-	-	-	469	-	955 per 100000 popn	-	193 per 100000 popn (WHO TB report 2012)
Uganda, Mityana and Mubende districts, 8 prisons, 2014	Kinaalwa 2015[39] (conference abstracts)	67	615	10.9	-	7.3 (UNAIDS 2014)					
Southern Africa											
Angloa											
Botswana	*2003: CDC TB prevalence[40]*										
Lesotho											
Madagascar	*2000: Rasolofo-Razanamparany clustering of TB within and outside the prison, to determine if transmission is likely to be higher within prisons[41]* *1995: Auregan TB prevalence[42]*										
Mauritius											
Mozambique, South, Central and North region, 5 prisons, 03/15-04/15	Mondlane 2015[43] (conference abstract)	-	-	-	-	-	(25)	(4969)	(0.50)	-	0.55 in 2014 (WHO TB report 2015)
Namibia, Opuwo, police detention cells, 3/15	Ruswa, 2015[44] (conference abstract)	-	-	-	-	-	(3)	(50)	(6.00)	-	Case notification rate 373 per 100,000 population in 2014 (WHO TB report 2015)
South Africa, Johannesburg, 1 prison , 9/09 to 10/10	Telisinghe, 2014[45] (journal article)	242	957	25.3[§]	-	17.8 (UNAIDS 2009)	44 (34)	978 (968)	4.50 (3.50)	Ex-smoker, HIV infection. *number of detainees/cell, duration of incarceration, previous incarceration and type of detainee	0.80 (WHO TB report 2011)

										not associated with undiagnosed TB.	
South Africa, Western Cape, 1 prison Results from 3/13	Skiti 2013[46] (conference abstract)	85	1176	7.2	-	18.9 (UNAIDS 2014)	(29)	(1176)	(2.90)	-	0.71 (WHO TB report 2014)
South Africa, 4 provinces, 5 prisons, 01/14-12/14	Zishiri 2015[47] (conference abstract)	2945	21773	14	-	18.9 (UNAIDS 2014)	(165)	(39621)	(0.40)	-	0.70 (WHO TB report 2015)
Swaziland 9 prisons	Dlamini, 2012[48] (conference abstract)	-	-	34.9	-	26.0 (UNAIDS 2011)	-	-	3.60	-	-
Zambia, 7 prisons, 4/09 to 7/10	Simooya, 2014[49] (journal article)	609	2219	27.4	*on univariate analysis female gender and being tattooed in prison associated with prevalent HIV. No association between time in prison, previous incarceration and type of detainee (on remand/sentenced)	13.5 (UNAIDS 2009)	-	-	-	-	-
Zambia, 5 prisons, 1/11 to 9/11	Hatwiinda, 2012[50] (conference abstract)	946	3923	24.1	-	12.5 (UNAIDS 2011)	-	-	-	-	-
Zambia, Lusaka, 1 prison – exit screening, 11/10 to 4/11	Henestroza‡, 2013[51] (journal article)	-	-	-	-	-	12 (10)	188 (186)	6.40 (5.40)	*on univariate analysis no difference in TB prevalence between entry, exit and mass screening.	0.34 (WHO TB report 2011)
Zambia, Lusaka, 1 prison – new entrant screening, 11/10 to 4/11	Henestroza‡, 2013[51] (journal article)	64	313	20.5	*On univariate analysis HIV prevalence during mass screening significantly higher than during entry	12.5 (UNAIDS 2011)	18 (17)	362 (371)	5.00 (4.70)	*on univariate analysis no difference in TB prevalence between entry, exit and mass screening.	0.34 (WHO TB report 2011)
Zambia, Lusaka, 1 prison – mass screening, 11/10 to 4/11	Henestroza‡, 2013[51] (journal article)	342	1247	27.4	*On univariate analysis HIV prevalence during mass screening significantly higher than during entry	12.5 (UNAIDS 2011)	99 (53)	1296 (1250)	7.60 (4.20)	*on univariate analysis no difference in TB prevalence between entry, exit and mass screening.	0.34 (WHO TB report 2011)
Zambia, Lusaka and Kabwe, 5 prisons, 1/11-9/11	Maggard‡ 2015[52] (journal article)	1077	4694	22.9	-	12.5 (UNAIDS 2011)	-	-	-	-	-
Zambia, Lusaka and Kabwe, 5 prisons – mass screening, 1/11-9/11	Maggard‡ 2015[52] (journal article)	-	-	-	-	-	180 (111)	3929 (3860)	4.60 (2.90)	-	0.34 (WHO TB report 2011)
Zambia, Lusaka and Kabwe, 5 prisons –comprehensive new entrant screening, 1/11-9/11	Maggard‡ 2015[52] (journal article)	-	-	-	-	-	35 (29)	799 (793)	4.40 (3.70)	-	0.34 (WHO TB report 2011)
Zimbabwe											

See web appendix 3 for study methods. ¶Independent risk factors from multivariable analysis controlling for possible confounders are presented where data were available. Risk factors from univariate analysis are indicated; [ʃ]all cases were bacteriologically confirmed except Angora 2011 (diagnostic algorithm unknown), Gidado 2014 (all forms of TB), Schwitter 2014 (all TB notifications), Dhlamini 2012 (unknown case definitions) and Bah 2012 (all pulmonary TB). †median HIV prevalence across the facilities. [§]HIV testing used the urine MAXIM HIV-1 EIA. [‡]Publication by Maggard et al 2015 includes data published by Henostroza et al 2014.Text in italics – literature preceding 2011. n=number of cases; N=denominator; %=proportion; RF= risk factor; IR=incidence rate; BMI=body mass index; popn=population; pyrs=person years; +ve=positive

For UNAIDS 2009 statistics: http://www.unaids.org/globalreport/documents/20101123_GlobalReport_Annexes1_em.pdf

For UNAIDS 2011 statistics: http://www.unaids.org/sites/default/files/media_asset/20121120_UNAIDS_Global_Report_2012_with_annexes_en_1.pdf

For UNAIDS 2014 statistics: http://www.unaids.org/en/regionscountries/countries

WHO TB report 2011: http://apps.who.int/iris/bitstream/10665/44728/1/9789241564380_eng.pdf

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WHO TB report 2013: http://apps.who.int/iris/bitstream/10665/91355/1/9789241564656_eng.pdf

WHO TB report 2014: http://apps.who.int/iris/bitstream/10665/137094/1/9789241564809_eng.pdf

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Web appendix 4: Study methods for epidemiological studies identified through the literature review

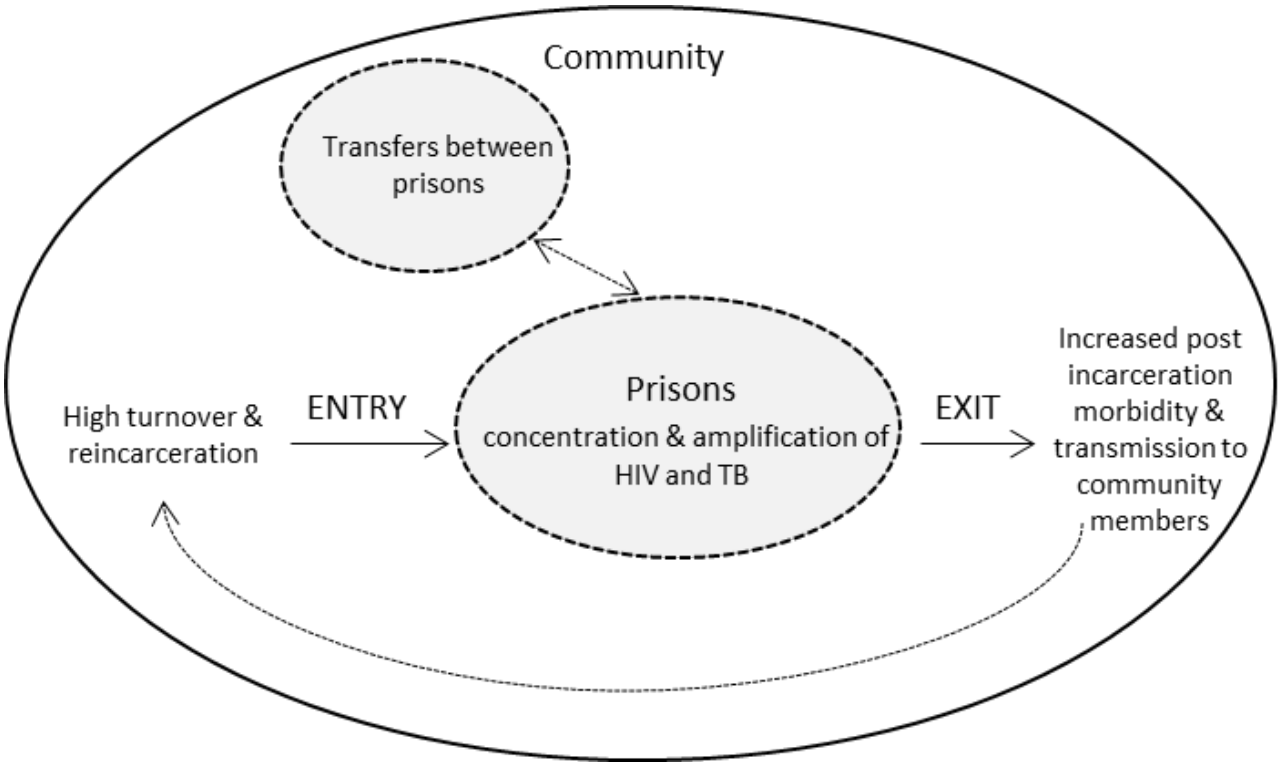
Author and publication year	Region, country and year	Methods	Diagnostic tests and case definitions
West and Central Africa			
Wachinou 2012	National, Benin, 9 prisons, 2011	Routine case notifications	TB=microscopy +ve
Diendre 2011	Ouagadougou, 1 prison, 2009	Random sample of 300 detainees (those awaiting trial and incarcerated) ≥18 years. Cough >1week – 3x sputum. HCT offered to all	Sputum: AFB. Blood for 2 rapid HIV tests. TB = cough + 2/3 sputum +ve for AFB
Noeske, 2011	Yaounde, Cameroon, 1 prison, 2009	Survey of all detainees≥14years. If cough ≥1week, 2 sputa. If smear –ve, 10/7 of antibiotics with repeat sputum testing if cough persists. HCT offered to all.	Sputum: AFB; culture on all AFB+v specimens and those without any other obvious cause for cough. Blood for 2 rapid HIV tests. TB=cough + smear and/or culture +ve.
Noeske, 2011	Cameroon, 10 prisons, 08-10	Data from routine HCT services to all new entrants to the 10 prisons. Overall 81% (n=6250) offered HCT.	NK
Noeske 2014	Cameroon 10 prisons targeted by the HIV/TB control programme of the Ministry of Justice. 10/11 to 9/12	Microbiologically confirmed cases of TB from the TB register for all detainees with a stay of >90days	Notifications: bacteriologically confirmed
Mashako, 2012	Bukavu Congo, 1 prison, 1/08 to 2/09	All detainess approached through HCT programme set up once a week in the prison.	NK
Kaswa Kayomo 2015	Kasai Oriental province, 1 prison, 2015	NK	TB=Xpert +ve
Angora 2011	Abijan, Côte d'Ivoire, 1 prison 11/08-3/10	TB screening offered systematically and on a voluntary basis to all new detainees. Screening mechanism NK. HCT offered systematically and on a voluntary basis to all new detainees and on request to detainees who were already incarcerated	Blood for 2 rapid HIV tests
Adibokah 2015	Ghana, 2012	Population under study NK. Stratified sample of males and all female detainees. Questionnaire and blood for HIV testing	NK
Bah 2012	Conakry, Guinea, 1 prison, 5/09-6/10	Both new entrants and the incarcerated population. Selection method NK. Clinical examination, CXR, sputum and lymph node biopsy	Sputum: AFB; culture. All cases of reported (pulmonary and extrapulmonary) reported
Camara 2014	Mali, 3 prisons	Routine programme data of passive case finding.	Sputum: AFB; culture. TB=bacteriologically confirmed
Ba 2015	Nouachott, Mauritania	Survey among 296/706 detainees. HCT offered.	NK
Gidado, 2014	Nigeria, 2013	Routine notifications data from all prisons in Nigeria. Screening within prisons consisted of symptom screening all detainees. All suspects have sputum collected for AFB	Notifications: all forms of TB
Muhammed 2012	Ogun state, Nigeria, 2 prisons	All detainees approached – 52% participated. Questionnaire and HCT.	Blood for 2 rapid HIV tests
Okorie 2014	Abia State, Nigeria 1 prison	Entire prison population clinically screened. Sputum collected if cough for 2 weeks.	Sputum: AFB. TB=cough for 2 weeks + smear +ve
Jaquet 2015	Senegal (Dakar) and Togo (Lome), 2013 and 2014	Random sample of detainees offered HCT	NK
Ekouevi, 2013	Togo, 6 prisons, 11/11 to 1/12	Survey in 6/12 of Togo's prisons to represent each of Togo's administrative regions. All detainees ≥18years who had been imprisoned for at least 30 days. HCT offered to all.	Blood for 2 rapid HIV tests
Akakpo 2013	Lome, Togo, 1 prison, 2011	Those who agreed to have HIV testing included (194/1890 in the prison agreed and took part). HCT offered.	NK
East Africa			

Author and publication year	Region, country and year	Methods	Diagnostic tests and case definitions
Addis 2015	Gondar, Ethiopia, 1 prison, 2/08 to 7/08	Detainees collectively asked about cough. Those with a cough were asked about duration. Detainees with a cough >2 weeks provided 3 sputum samples.	Sputum: AFB. TB=cough >2 weeks + smear +ve
Abebe 2011	Dire Dawa, Jijiga and Harar, Ethiopia, 3 prisons 7/08 to 11/08	Survey of all detainees in the 3 prisons. All screened for cough ≥2 weeks. If symptomatic sputum collected.	Sputum: AFB and culture. TB=cough ≥2 weeks + smear and/or culture +ve
UNODC 2013	8 regions in Ethiopia, 23 prisons, 2013	2 stage sampling techniques used to select prison units and detainees. Random sample of all detainees >18 years. Questionnaire and HCT.	Blood for 2 rapid HIV tests
Moges, 2012	Gondar, Ethiopia,	All detainees screened for symptoms. If cough ≥ 1 week, 3 sputum samples, FNAC of LN and blood for HIV testing.	Sputum: FM. FNAC – wright's stain. HIV testing using ELISA. TB=cough ≥1 week + smear +ve or epithelioid granuloma and necrosis on FNAC.
Ali 2015	Oromia, Nationalities and Peoples Regional State and Harari, Ethiopia, 13 prisons, 2013	All detainees screened for TB symptoms using WHO tool. If aged ≥ 18 years and those who fulfilled at least one of: score of 5 on the WHO TB suspect identification criteria, was treated for TB in the last 5 years or was HIV infected – Questionnaire; x2 sputa, HCT	Sputum: 1 for AFB; 1 for culture. TB = symptoms and/or HIV+ve and/or previous TB treatment + smear and/or culture +ve
Benson Otieno, 2011	Kenya, 36 prisons, 9/09-10/09	Scale up of HCT from 26 to 36 Kenyan prisons.	
Kanyerere 2012	National data, Malawi, 2007	All detainees in all 27 prisons in Malawi. Used routinely collected data to determine TB case notification rates. Cough >1 week – x2 sputum	Sputum: smear. TB =cough>1 wk and smear +ve
Mwapasa 2012	Malawi, 10 prisons, 2011	Random sample of male and all female detainees. Questionnaire. Cough – 3x sputum. HCT offered.	Sputum: FM; culture. Blood for 2 rapid HIV tests. TB=cough + smear and/or culture +ve
Kanyerere 2015	Malawi, Mzimba prison, 2015	All detainees available over the 4 days of screening. Questionnaire and CXR for all. Sputum x2 if symptomatic or abnormal CXR.	Sputum: FM; Xpert. TB=symptoms and/or CXR abnormality + smear and/or Xpert +ve
Ruseesa. 2014	Rwanda, 3/14 prisons, 12/13 to 4/14	CXR for all detainees. Abnormal CXR. Sputum collected.	Sputum: FM; Xpert. TB=CXR abnormality + smear and/or Xpert +ve
Ruseesa 2015	Rwanda, all 14 prisons, 12/13-04/15	Routine screening data. CXR screening – if abnormal sputum	Sputum: FM; Xpert; TB=CXR abnormality + smear and/or Xpert +ve
Ibrahim 2013	Khartoum, Sudan 5 prisons	Sample of 382 selected from all detainees with probability proportional to size. 3 sputum samples	Sputum: AFB; TB=smear+ve
Angolwisye, 2011	Mbeya, Tanzania, 3 prisons, 11/10 to 3/11	Survey of all detainees in the 3 prisons. 2 sputum samples from all. HCT offered to all	Sputum: FM; Xpert on 1 sample. TB=smear or Xpert positive
Clowes, 2013	Mbeya, Tanzania. All prisons in the region 11/10 to 11/11	All incarcerated detainees screened using 2 sputum samples. Screening done twice to capture all detainee (n=2539 screenings done)	Sputum: FM; Xpert on 1 sample. TB=smear and/or Xpert +ve
Clowes, 2013	Mbeya, Tanzania. All prisons in the region 11/10 to 11/11	From 3/11 all new entrants to the prisons screened with 2 sputum samples (n=5319 screenings done)	Sputum: FM; Xpert on 1 sample. TB=smear and/or Xpert +ve
UNODC 2013	12 prisons in all 5 zones in Tanzania, 2012	Multistage sampling used. Random sample of detainees. HCT offered to all	Blood for 2 rapid HIV tests
Mangu, 2014	Tanzania, 5 prisons, 7/13 to 4/14	All incarcerated detainees and new entrants screened with a sputum sample in 4 prisons. CXR followed by a sputum sample used in 1 prison. HCT offered to all	Sputum: Xpert. TB=Xpert +ve
Van Den Hombergh 2015	Dar es Salaam, Tanzania, 3 prisons, 7/13-3/15	All detainees and new admissions screened. CXR and sputum.	Sputum: Xpert. TB=Xpert +ve
Mutayoba 2014	Tanzania	Prisons in Mainland Tanzania stratified by level of security and 12 randomly selected. Juvenile and female prisons were purposively selected. 776 detainees were enrolled. Questionnaire and blood for HIV testing.	NK
Schwitter 2014	Uganda, 10 Regional Ugandan Prison Health Centres 6/11 to 11/12	All detainees ≥18 years of age diagnosed with TB and registered on the Heath Management Information System.	Notifications

Author and publication year	Region, country and year	Methods	Diagnostic tests and case definitions
Kinwaawa 2015	Mityana and Mubende districts, Uganda, 8 prisons, 2014	Routine programme reporting. Screening for HIV.	NK
Southern Africa			
Mondlane 2015	South, Central and North region, Mozambique, 5 prisons, 2015	Quarterly TB awareness talks. If cough, fever, night sweat or weight loss for 1 week – verbal invitation to provide sputum for testing.	Sputum: Xpert. TB=symptoms + Xpert +ve
Ruswa 2015	Opuwo, Namibia, police detention cells, 2015	All detainees screened for cough, weight loss, night sweats, fever and lymphadenopathy. If present – 2x sputum	Sputum: smear; Xpert. TB=symptom + smear and/or Xpert +ve
Telisinghe, 2014	Johannesburg, South Africa 1 prison, 9/09 to 10/10	Survey of a random sample of incarcerated detainees with a stay >6months and consecutive sample of newly sentenced detainees. Males only. Symptom questionnaire, 2 sputum samples, CXR, anonymised urine for HIV testing	Sputum: FM; culture. Urine tested with MAXIM HIV-1 urine EIA. TB=smear and/or culture +ve
Skiti 2013	Western Cape, South Africa, 1 prison, Results from 3/13	Screening all detainees for HIV and TB by lay and adherence counsellors. HCT offered to all. Xpert machine installed in 2/13. Symptom screening followed by sputum if symptomatic.	Sputum: Xpert. TB=symptoms + Xpert +ve
Zishiri 2015	4 provinces in South Africa, 2014	Routine TB screening among all detainees. If symptomatic – sputum. HCT offered to all	Sputum: Xpert. TB=symptoms + Xpert +ve
Dlamini, 2012	Swaziland, 9 prisons	Survey of a sample of n=490 with probability proportion to size of detainees, incarcerated for >3months, from 9 prisons. Sputum. Blood for HIV testing.	NK
Simooya, 2014	Zambia, 7 prisons, 4/09 to 7/10	Survey of a sample of the prison population. Sampling method unclear. HCT	Blood for ELISA ×2
Hatwiinda, 2012	Zambia, 5 prisons, 1/11 to 9/11	TB/HIV screening of all incarcerated detainees and new entrants to the prison. HCT offered to all.	NK
Henestroza, 2013	Lusaka, Zambia, 1 prison 11/2010 to 4/2011	TB/HIV screening programme. Exit screening of all detainees leaving the prison with 2 sputa, symptoms screen and physical examination.	Sputum: FM, culture. TB=smear and/or culture +ve.
Henestroza, 2013	Lusaka, Zambia, 1 prison, 11/2010 to 4/2011	TB/HIV screening programme. Entry screening of all detainees entering the prison with 2 sputa, symptom screen, CXR and HCT.	Sputum: FM; best quality specimen cultured. Blood for 2 rapid HIV tests. TB=smear and/or culture +ve.
Henestroza, 2013	Lusaka, Zambia,1 prison, 11/10 to 4/11	TB/HIV screening programme. Mass screening of all detainees within the prison with 2 sputa, symptom screen, CXR and HCT.	Sputum: FM; best quality specimen cultured. Blood for 2 rapid HIV tests. TB=smear and/or culture +ve.
Maggard 2015	Lusaka and Kabwe, Zambia, 5 prisons, 2011	All new entrants and sentenced detainees screened. Questionnaire, CXR, physical exam and x2 sputa on all. HCT offered to all.	Sputum: FM; culture of 1 sputum. TB=smear or culture +ve

For results see web appendix 3. –ve=negative; HCT=HIV testing and counselling; AFB=acid fast bacilli; +ve=positive; FM=fluorescent microscopy; Xpert=GeneXpert MTB/RIF; FNAC=fine needle aspiration cytology; ELISA=enzyme linked immunosorbent assay; CXR=chest X-ray; EIA=enzyme immunoassay; NK=unknown

Web appendix 5: The revolving door effect – the prison and community context



Web appendix 6: Administrative structures and policies in South Africa, Malawi, Benin, Zambia and Nigeria

	SOUTH AFRICA (2015)	MALAWI (2014)	BENIN (2012)	ZAMBIA (2015)	NIGERIA (2014)
Ministry Responsible	Department of Correctional Services	Ministry of Home Affairs and Internal Security	Ministry of Justice, Legislation and Human Rights	Ministry of Home Affairs	Ministry of Internal Affairs
Administrative Unit	Department of Justice and Correctional Services (2014)	Malawi Prison Service (MPS)	La Direction de l'Administration Penitentiaire et de l'Assistance Sociale (DPAS)	Zambia Prison Service (ZPS)	Nigerian Prisons Service
Guidance on Health in Legislation	Correctional Services Act (2012) - General entry screening by MO - Min. living & health standards - Standing Orders - Stipulate cell size, ventilation, preventive & curative care	The Prisons Act (1966)	Decret N°73-293 du 15 Septembre 1973 portant sur le régime pénitentiaire en République du Bénin	The Prison Act (2001) Vests authority for all health matters in Director of Health but not specific details.	The Prisons Act (2004) - General entry screening by MO - Discharge for life-threatening conditions -Superintendent + MO may transfer detainees with TB to protect others - No discharge if detainee has 'acute' condition without MO clearance
Guidance for Prison Health in Strategic Plans	- National Strategic Plan on HIV, STIs and TB - Intensified TB case-finding with most at risk populations including detainees - Annual risk assessments for TB infection control in prisons - Package of HIV, STI, TB treatment services available to 80% of population by 2016/17	- *National HIV/AIDS Strategic Framework 2015-2020* - Active, routine & outreach based HIV case-finding for detainees with follow-up C&T *National Strategic Plan for Prevention & Control of TB 2015-2020* - TB registration in health units of 5 major prisons - Routine entry/exit screening - Basic TB and TB/HIV training for prison officers - Intensified awareness campaigns	*National Programme on HIV and AIDS: Monitoring of HIV Infection and syphilis in Benin, 2010.* -Develop prevention and care services tailored to detainees	- *National HIV/AIDS Strategic Framework 2014-2016* - Strengthen mobile ART services to detainees - Conduct behavioural & HIV prevalence surveys with detainees targeting reduction from 27.4% (2013) to 24.% (2016) - *National Health Strategic Plan 2011-2015* - Expand and strengthen TB program for prisons	– *National HIV/AIDS Strategic Plan 2010-15* - At least 80% detainees exposed to safer-sex education by 2015 (NB: no action on condom or lubricant provision) - *National Strategic Plan for TB and Leprosy Control 2010-15* - DOTS in at least 85% of prisons - Train 5 HCW in each of 85% of prison health facilities in DOTS - Establish public-private partnerships to scale-up TB activities in prisons
Policies guiding prisons TB Care & Treatment	*Guidelines for Management of TB, HIV and STIs in Correctional Centres* (DOH, 2013) Comprehensive suite of interventions for TB and HIV care and treatment in prisons	*Malawi Policy on Tuberculosis Control in Prisons* (MHA/MOH, 2007) Comprehensive suite of interventions for TB and HIV care and treatment in prisons	Use *National Tuberculosis Guide (NTP, 2009).* - No specific guidance for prisons	*National Tuberculosis and Leprosy Programme** - No specific guidance for prisons *Guidelines for the Programmatic Management of Drug-Resistant TB** -Send sputum sample for culture and DST from detainees	*The National Guidelines for TB Infection Control* - Mentions prisons, but no specific guidance provided.
Policies guiding prisons HIV Care and Treatment	*Guidelines for the Management of TB, HIV and STIs in Correctional Centres* (DOH, 2013) - Comprehensive actions regarding prison TB and HIV care and treatment activities	*Clinical Management of HIV in Children and Adults: Malawi Integrated Guidelines for Providing HIV Services* (MOH, 2014) - No specific guidance for prisons	MOH guidelines	*Adult and Adolescent Antiretroviral Therapy Protocols* (MOH, 2010) - No specific guidance on prisons - (NB: UNODC currently supporting MOH to develop prison-specific documentation)	*National Guidelines for HIV and AIDS Treatment and Care in Adolescents and Adults* (MOH, 2010) - No specific guidance for prisons

MO=Medical Officer; min=minimum; STIs=sexually transmitted infections; DOTS=Directs Observed Treatment, Short-course; HCW=health care workers; DOH=Department of Health; MHA=Ministry of Home Affairs; MOH=Ministry of Health; NTP=National TB Programme; DST=Drug Susceptibility Testing; UNODC=United Nations Office on Drug and Crimes. *NB: UNODC currently supporting Zambian MOH and MHA to develop prison-specific documentation guiding TB and HIV care and treatment.

Web appendix 7: References for Text box 3 and 4

Text box 3

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Text box 4

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